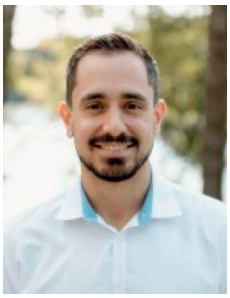
The digital transformation imperative for investment and wealth managers

Received (in revised form): 26th August, 2025

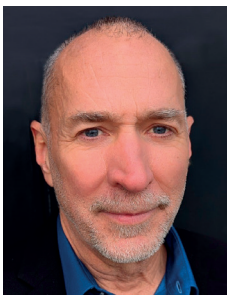
Thomas Izzo*
Head of Sales, Charles River Development, USA

Frank Smietana**
Head of Content and Insights, Charles River Development, USA

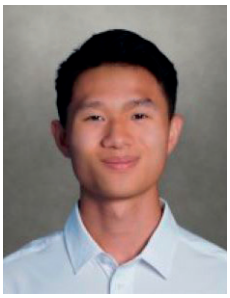
Aaron Lai†
Marketing Intern, Charles River Development, USA



Thomas Izzo



Frank Smietana



Aaron Lai

Charles River Development, a State Street Company, 700 District Avenue, Burlington, MA 01803, USA

**Tel: +1 203 906 9100; E-mail: ThomasIzzo@crd.com*
***Tel: +1 317 985 0992; E-mail: FrankSmietana@crd.com*
†E-mail: aaron.lai@tufts.edu

Journal of Securities Operations & Custody
Vol. 18, No. 1, pp. 89–98

Included in **The Business & Management Collection** (https://hstalks.com/business/)

Thomas Izzo *is Head of Sales at Charles River Development, a State Street Company. He is responsible for sales of the Charles River Investment Management Solution, a front and middle office technology platform. Previously, he worked as a sales engineer and analyst. Thomas also leads panels at InvestOps, Fixed Income Leaders Summit and other industry conferences, and holds a BS in electrical and computer engineering from Worcester Polytechnic Institute.*

Frank Smietana *heads Content Strategy and Insights at Charles River Development, a State Street Company. He is responsible for thought leadership exploring technology solutions across the institutional investment process for fund managers, asset owners, official institutions and the outsources chief investment officer (OCIO) sector. Previously he worked as a laboratory robotics engineer at Eli Lilly, a quantitative analyst at UBS and sales engineer at Paradigm4. Frank holds a BS in mathematics and computer science and a BA in German literature from Butler University.*

Aaron Lai *is studying economics with a minor in entrepreneurship for social impact at Tufts University, along with certificate coursework in impact and sustainable investing. His academic and professional experiences reflect a commitment to using technology and analytics to improve decision making, streamline workflows and deliver long-term value for stakeholders. As a Marketing Intern at Charles River Development, a State Street Company, Aaron supports initiatives related to product marketing, thought leadership and industry engagement. His work includes developing content on topics such as whole-of-fund portfolio management, execution management systems and data-driven decision making for global investment managers, asset owners and insurance companies.*

Abstract

Digital transformation has emerged as a strategic imperative for investment and wealth managers navigating a rapidly evolving financial landscape. This paper explores the multifaceted impact of digital transformation across competitive positioning, operational efficiency, client engagement, data-driven decision making and regulatory compliance. It argues that technology adoption alone is insufficient; successful transformation requires strategic clarity, cultural alignment and organisational readiness. The paper highlights how digital platforms and analytics enable companies to differentiate services, enhance client experiences and improve return on invested capital. Operationally, digital transformation streamlines workflows, reduces costs and mitigates risks associated with legacy systems and manual processes. The transition to cloud-native architectures and artificial intelligence (AI)-driven reconciliation supports scalability and resilience, particularly under market stress. Enhanced client engagement through omnichannel access and personalised

insights fosters loyalty and asset stickiness. Data analytics empower investment managers to refine portfolio strategies and optimise company-level decisions, while digital infrastructures facilitate timely and transparent regulatory reporting. The paper also examines emerging opportunities in know your customer/anti-money laundering (KYC/AML), credit ratings and primary fixed-income issuance, where digital tools are reshaping traditional workflows. Ultimately, digital transformation is positioned not merely as a technological upgrade but as a foundational shift in how investment companies create value, manage risk and serve clients. The paper concludes by emphasising the need for sustained leadership commitment and strategic investment to future-proof organisations in an increasingly tech-centric financial ecosystem. This article is also included in ***The Business & Management Collection*** *which can be accessed at https://hstalks.com/business/.*

Keywords: digital, transformation, data, AI, optimisation

DOI: 10.69554/EJVX8836

INTRODUCTION

Digital transformation (DT), the integration of digital technology into all areas of a business, has become a strategic necessity across the global financial sector. Driven by rising client expectations and preference for low-fee products, expanding regulatory mandates across jurisdictions and the emerging threat of disintermediation from non-traditional competitors, investment companies and wealth managers are facing increasing pressure to modernise legacy systems and adopt advanced digital technologies to stay competitive.

Technology alone, however, is not sufficient. According to McKinsey,[1] companies that pair digital initiatives with effective change management realise 143 per cent of expected return on investment (ROI) — over four times the return achieved by companies with weak implementation efforts.

These figures illustrate that for digital transformation to be successful, it must be supported by strategic clarity, organisational readiness and a commitment to cultural change. While industry executives recognise digital transformation as imperative, effective execution is not guaranteed.

The productivity and financial benefits promised by digital workflow tools need to be measurable, including human time savings, reduced error rates, faster processing cycles and cost reductions. Collecting, curating and communicating that data to stakeholders is key to successful digital transformation initiatives.

This paper examines the strategic implications of digital transformation for investment and wealth management, with a global perspective on why it is both important and necessary. Key areas of impact include competitive advantage, operational efficiency, client experience and data-driven decision making. It also explores emerging digital transformation focus areas across retail and institutional markets.

COMPETITIVE ADVANTAGE IN A DIGITAL ERA

Incumbent fund managers and advisers that are slow to embrace digital transformation risk losing market share to more agile, digitally native competitors. Digital technologies offer multiple competitive benefits.

First, they enable innovations in business models. Digital platforms can connect asset managers with a wider network of distributors and partners, breaking down traditional value chains. McKinsey observes that digital transformation is a fundamental 'rewiring' of how organisations operate. They build competitive advantage via DT by 'continuously deploying tech at scale to improve customer experience and reduce costs'. Specifically, for asset managers, McKinsey notes that

companies that adopt a 'wealth-building' technology mindset, wherein companies treat tech investments as profit drivers, can create 'strategic distance' from traditional competitors.[2]

Companies that have been quick to seize such opportunities are already capturing market share that once belonged to established players. In contrast, laggards find themselves constrained by legacy processes that limit their agility in responding to changing client demands and market trends.

Secondly, digital transformation drives competitive differentiation. Companies that invest in analytics, automation and intuitive client-facing technologies can offer superior services that set them apart. For example, a company that utilises artificial intelligence (AI)-driven portfolio analytics can offer timelier and personalised investment advice than competitors relying primarily on manual, backward-looking insights. McKinsey research reveals that investors using analytics across multiple asset classes achieved a 5.3 per cent increase in return on invested capital (ROIC) compared to their peers.[3]

Similarly, an investment service with a modern mobile app and seamless online onboarding will be more attractive to retail wealth clients than a competitor with manual, paper-based processes. In an industry where core products such as mutual funds and exchange traded funds (ETFs) can appear commoditised, digitally enabled service differentiation is crucial for attracting and retaining clients.

Finally, digital transformation is increasingly linked with brand and reputation. Leading global investment companies signal their innovation by publicising digital initiatives such as sustainable investing platforms, robo-advisory services or data-driven investment ideation. This not only appeals to clients but also to talent; investment professionals, especially younger individuals, prefer to join organisations with modern technology and a culture of innovation. In sum, digital maturity has become synonymous with industry leadership.

OPERATIONAL EFFICIENCY

A core outcome of successful digital transformation is improved operational efficiency. In investment management, operational excellence is crucial for controlling costs and managing risk, but historically, unconnected legacy systems have introduced bottlenecks, complex workarounds and the potential for costly errors. Digital technologies are now enabling companies to streamline their operations across their front, middle and back office, yielding faster processing, lower error rates and reduced operating costs. Automation, AI and cloud technologies are key to achieving leaner and more agile operations.

By reallocating resources from low-value manual tasks to high-value services, digital initiatives can enhance both the bottom line and the customer experience. Automation of routine processes (trade processing, compliance checks, client and regulatory reporting) reduces labour-intensive work and minimises the potential for human error. Likewise, migrating systems to the cloud and adopting modern data architectures can reduce IT maintenance costs and improve scalability. Two examples are the ability to handle spikes in trading volumes during periods of elevated market turbulence and responding to new regulatory reporting requirements with minimal marginal cost, with a study finding that 'implementation of digital technology enables companies to speed up workflows, reduce costs, improve process accuracy, and prepare the foundation for continuous innovation'.[4]

Many investment companies are saddled with technology debt incurred from maintaining and upgrading decades-old portfolio management, trading and accounting systems, typically accumulated over the course of

multiple mergers and acquisitions. Difficult to maintain and subject to key-person risk as IT staff retire, legacy systems are also inflexible and incapable of extensibility or scale. This hinders innovation and slows product and service delivery. Digital transformation addresses this by modernising core infrastructure — for example, replacing on-premises systems with cloud-based platforms or integrating modular FinTech solutions through application programming interfaces (APIs). By replacing legacy systems, companies can finally achieve straight-through processing and real-time data access.

While the upfront costs of acquiring and implementing a modern technology platform can be a significant one-time expense, adoption not only lowers operating costs but also improves agility, allowing companies to respond faster to market changes, add new business lines and asset classes without major disruption, and offer innovative investment products to their institutional and retail investors faster and more frequently.

Another dimension of efficiency is organisational agility and resilience. Digital tools enable more flexible and adaptive operations. For example, during the COVID-19 pandemic, companies with robust digital collaboration tools and cloud-based systems seamlessly shifted to remote operations, while less-prepared companies struggled to adapt, underscoring how digital readiness translates to operational resilience under pressure. A study found that, controlling for demand conditions, digitally enabled companies faced a 4 per cent lower decline in sales during the pandemic compared to their digitally constrained counterparts.[5]

Globally, the pandemic accelerated acceptance of digital workflows in financial services, reinforcing the idea that agility born of digital investments is a competitive necessity rather than a luxury. Two recent examples include client onboarding for financial advisers and trade reconciliation for investment companies.

For financial advisers, Docusign, Zoom calls and digital client onboarding platforms gained rapid adoption, significantly reducing the need for travel and in-person meetings. Traditional adviser overheads such as printers, paper, ink cartridges and even a brick-and-mortar office have been reduced or eliminated, further driving down costs and lowering barriers to entry for new advisers.

For investment companies, digital trade reconciliation is increasingly gaining a foothold driven by growing trade volumes and the 2024 transition from T+2 to T+1 settlement cycles. Digital trade reconciliation technology automates and streamlines the process of matching and verifying financial transactions across systems, counterparties and data sources involved in the trade life cycle.

With millions of transactions processed daily, even minor discrepancies create significant financial and compliance risks. Automated reconciliation ensures accurate alignment of payments, transfers and settlements. This significantly reduces manual processing errors, ensures a timely close of the company's accounting book of record, and supports compliance with growing regulatory reporting requirements across jurisdictions.

Machine learning (ML) algorithms continuously learn from new trade and transaction data to predict discrepancies and flag anomalies. This adds significant analytical capability given the constantly changing nature of transactions and fund flows. The transition from manual to digital reconciliation is transforming how banks and counterparties manage their financial operations, turning a manual, costly process into a strategic differentiator.

Operational efficiency gains from digital transformation free up capacity for innovation and differentiation. When routine tasks are automated, human talent can focus on research, client engagement and product

development. Essentially, a digitally transformed operating model allows investment managers to do more with less: executing faster, at lower cost, and with greater flexibility.

CLIENT EXPERIENCE AND ENGAGEMENT

Today's investors, whether institutional or retail, expect high-quality, technology-enabled interactions with their banks, financial advisers and investment managers. In a world where consumers manage much of their lives through smartphones and online platforms, clients increasingly prefer companies that offer intuitive mobile apps, real-time portfolio information and omnichannel access to advice.

Digital transformation provides the tools to meet and exceed these expectations. For example, an investment manager can use data analytics to better understand 'customer behaviour, predict needs and personalise services'.[6] Instead of static, backward-looking reports, clients receive tailored insights into their portfolio's performance, scenario analyses and product recommendations aligned with their goals and risk profile.

Seamless multichannel service is another cornerstone of a superior client experience. Digital leaders enable clients to interact on their terms, whether on their phone, laptop, video conference or in-person when needed, with all channels providing a consistent and integrated experience. Multichannel service in investment services could look like a client who can access their portfolio on an app, chat with a financial adviser online and later review a follow-up analysis via e-mail, all without repeating information or encountering delays. As Peter C. Verhoef *et al*. suggests, digital transformation creates 'additional customer value through enhancing user experiences'.[7] Achieving this fluid experience requires back-end integration of client data and communications, which is itself a product of digital transformation: consolidating data streams, customer relationship management systems and communication tools.

Digital platforms enhance transparency and trust — crucial elements of the client–manager relationship. Granting clients on-demand visibility into their accounts and performance metrics makes them feel more in control and informed. Interactive dashboards and mobile apps delivering AI-driven insights can empower clients with information that previously took days of manual analysis to produce. This not only improves satisfaction but also positions financial advisers and investment managers as transparent and trusted partners. In contrast, companies that still use mailed paper statements risk appearing outdated and less client-friendly. It is telling that industry surveys consistently find client experience to be a top differentiator in wealth management — even more so than product performance in some cases,

Finally, an underappreciated aspect of digital client engagement is its effect on client acquisition and retention. A strong digital presence, including educational content, social media engagement and easy account onboarding, helps financial advisers attract new clients, especially younger 'digital natives'. Financial technology startups have excelled at using digital marketing and well-designed user interfaces to win customers, challenging traditional brokerages and wealth managers.

Once onboarded, clients are more likely to stay if their ongoing experience is positive and convenient, ensuring asset 'stickiness' for the provider. Features such as 24/7 account access, instant transaction confirmations and timely alerts about portfolio changes all contribute to peace of mind and customer loyalty. In summary, digital transformation enables wealth managers and advisers to deliver superior client experience marked by personalisation, convenience and trust,

which is essential to creating and sustaining long-term client relationships.

DATA-DRIVEN DECISION MAKING AND ANALYTICS

For investment managers, data, when refined through analytics, can empower decision making and performance. The proliferation of big data, ML algorithms and generative AI (GenAI) tools is changing how investment decisions are made and how firms are run at a fundamental level. DT equips investment managers to use vast quantities of data — whether market, client or alternative data — and convert it into actionable insights.

Companies that become truly data-driven can achieve superior investment outcomes, more effective risk management and continuous learning and improvement in their operations. One benefit of data-driven decision making is the potential for improved investment performance through differentiated analytics. Portfolio managers now have analytical capabilities that far exceed what was available even a decade ago. For example, quantitative managers can use AI and ML models to identify complex patterns in market movements or to process unstructured data such as earnings call transcripts or satellite images of economic activity for an informational edge.

Fundamentally focused investment managers also benefit from data-driven tools: scenario analysis, factor attribution and risk modelling are increasingly being enhanced by AI, leading to more informed asset allocation and security selection. With the integration of these tools through digital transformation, investment companies move to decision making supported by comprehensive, real-time analysis of data. Academic research has linked such data-driven decision making with higher company productivity and profitability, highlighting that the effective use of information is a key competitive differentiator in performance.[8]

Beyond portfolio management, data-driven strategies improve operational and strategic decisions at the company level. Operations teams can deploy analytics for forecasting business key performance indicators (KPIs), optimising resource allocation and monitoring compliance. Similarly, sales and marketing teams can analyse client behavioural data to improve their outreach and product development, identifying which client segments respond to which offerings, focusing efforts where they have the greatest impact.

Deloitte research shows that 81 per cent of global leaders identify productivity as the key measure of success in their digital transformation efforts. Companies that monitor a broader set of operational KPIs are 20 per cent more likely to realise medium to high enterprise value, reinforcing that digital transformation initiatives targeting process optimisation and cost reduction yield tangible returns.[9] In this way, data-driven decision making fosters a more responsive and evidence-based management culture, replacing gut feel with insights grounded in data.

Many investment organisations, however, are still in the early stages of becoming truly data driven. A global industry study by PricewaterhouseCoopers (PwC) found that while 73 per cent of asset and wealth management companies acknowledge AI as the most transformative technology for the next few years, 68 per cent of companies still allocate less than one-sixth of their investment budget to it.[10]

The gap between theory and execution suggests that companies recognise the power of data and AI but have yet to fully commit the resources to capitalise on it. Overcoming this gap is an essential part of digital transformation. It typically requires hiring new talent while also upskilling existing staff, upgrading to modern cloud-native data platforms, and addressing data quality and governance issues so that decision makers trust the insights provided.

Investment companies must also promote a mindset where empirical evidence is valued and sought in decision processes. Company executives need to champion data usage and create forums for sharing insights across the organisation. As transformation expert Behnam Tabrizi noted, many digital transformation efforts fail due not to the technology itself but to organisational and cultural factors.[11] A company culture that embraces technology, from the chief executive officer (CEO) to the analyst, is more likely to fully realise the benefits of digital tools.

COMPLIANCE AND REGULATORY REPORTING

Compliance and regulatory reporting have become increasingly complex and operationally intensive for investment companies. Regulators are requiring more detailed, frequent and transparent disclosures, placing pressure on companies to demonstrate compliance while avoiding costly penalties or reputational damage. Traditional rule-writing approaches to compliance, which are often reliant on human experience, are no longer sufficient. Digital transformation presents an opportunity for investment managers to meet these obligations effectively.

Modern digital infrastructures, particularly those built on cloud-based platforms and real-time data architectures, enable companies to automate regulatory reporting processes. These systems allow for data aggregation across trading, risk, client and operational domains. This facilitates faster and more accurate regulatory submissions. Tools such as regulatory dashboards, workflow automation and AI-driven anomaly detection reduce the need for human intervention and provide regulators with greater visibility into the underlying data used in reports. For example, investment companies subject to regulations such as the Markets in Financial Instruments Directive (MiFID II) in Europe or Form PF in the US increasingly use digital platforms to ensure compliant and timely reporting across asset classes.

DT also plays an important role in enabling environmental, social and governance (ESG) integration across the investment management ecosystem. As retail investor demand for impact and sustainable investing has grown, asset managers are under pressure to assess ESG risks and opportunities. ESG data, however, is often unstructured and non-standardised, making it difficult to analyse using conventional systems and methods. AI and natural language tools have accelerated information discovery and extraction from unstructured data, allowing companies to analyse massive amounts of ESG-related information, from corporate sustainability reports to satellite imagery and news sentiment.

These capabilities support more granular ESG scoring, trend identification and real-time monitoring of performance at both the company and portfolio levels. Additionally, digital platforms can facilitate automated ESG reporting aligned with regulatory frameworks such as the Sustainable Finance Disclosure Regulation (SFDR) and Task Force on Climate-related Financial Disclosures (TCFD), improving transparency and accountability to investors and regulators. By embedding ESG analytics into portfolio construction, risk management and client reporting processes, investment managers can meet growing disclosure requirements and also generate insights that inform sustainable alpha generation. Thus, digital transformation serves as a compliance enabler and helps align investment decisions with long-term environmental and social impact.

As an IEEE Computer Society publication suggests, ‘undergoing digital transformation allows organisations to efficiently and effectively collect and analyze large quantities of data. This data has a multitude of uses, including allowing companies to measure

their performance when it comes to their ESG initiatives'.[12]

DIGITAL TRANSFORMATION OPPORTUNITIES

Across the financial services ecosystem, business-as-usual processes and mindsets are ripe for digital transformation. Both incumbent and non-traditional vendors are bringing innovations to market. We highlight three examples: know your customer/anti-money laundering (KYC/AML), corporate credit ratings and primary fixed-income issuance.

KYC and AML

Digital identity verification is transforming KYC and AML processes in banking and asset management, leveraging biometric authentication and AI. Driven by growing regulatory pressure, rising financial crime and high customer expectations, the shift from physical, in-person KYC checks to a digital, perpetual KYC model is enabling real-time monitoring of customer risk, with AI models continuously learning from new transactions to identify new anomalies and improve predictive accuracy. Triggering events such as watchlist inclusion, sanctions or adverse media are flagged for human investigation. On the horizon, McKinsey posits that the automation potential of Agentic AI will significantly increase the scale and accuracy of companies monitoring transactions for potential fraud.[13] The ability to identify and potentially mitigate fraudulent transactions without inconveniencing customers while also lowering demand for compliance staff is driving significant innovation in KYC/AML.

Corporate credit ratings

Nationally recognised statistical rating organisations (NRSROs) are responsible for rating the credit quality of corporate entities and the financial instruments they issue. The complex and seemingly opaque rating process has invited industry criticism, especially in the wake of the 2008 global financial crisis, when rating agencies were blamed for inadequately understanding and communicating the risk posed by mortgage-backed securities composed of non-performing loans.

Digital transformation and recent advances in GenAI have created significant opportunities for ratings agencies to leverage growing volumes of unstructured data in order to gain differentiated insights into creditworthiness. The ability to automate much of the data collection and aggregation has also powered their expansion into rating private credit deals.

Rated companies in turn benefit from increased information transparency and improved internal controls. With more accurate risk assessments from rating agencies, companies can benefit from lower bond credit spreads and financing costs as creditworthiness improves.

For institutional investors holding rated debt in their portfolios, dynamically updated scoring provides portfolio and risk teams with insights into changes in borrower behaviour or market conditions.

Primary fixed-income issuance

The process of issuing new fixed-income securities in the primary market has long been burdened by a lack of structure and standardisation, disjointed communications and manually intensive workflows. This injected significant operations friction and cost across the issuance ecosystem, from issuers to underwriters to investors.

Electronification of primary issuance enhanced by AI is now helping underwriters optimise deal pricing, predict investor demand and even suggest deal time windows, with the potential to price at lower spreads.[15] For investors, real-time digital deal communication democratises access to new issues for smaller companies that lacked traditional underwriter relationships.

CONCLUSION

The financial industry's ongoing digital revolution presents both significant opportunities and risks for investment and wealth managers. On the one hand, it can create competitive advantages by allowing companies to operate at greater efficiency and scale than was previously possible. Empowered by technology, these companies can also differentiate their product and service offerings in a crowded marketplace. DT also drives operational efficiency, which is essential for profitability and for responding to market disruptions, timelier regulatory reporting and meeting investors' expectations for personalised, real-time and seamless service across all channels. It also enables data-driven decision making, turning rapidly growing volumes of raw data into insights that better inform critical investment and risk decisions.

At the same time, the digital transformation journey is complex, requiring a thoughtful approach and C-level sponsorship. The failure rate of past initiatives cautions that simply spending money on technology is not enough: successful digital transformation requires an alignment of technology adoption, clear strategy, acquiring new talent, upskilling people and rethinking organisational culture. Likewise, management needs to make a sustained commitment to budgeting and investments because digital transformation initiatives take time to implement.

Executive leadership must have a clear vision for how digital transformation supports their value proposition. For some, the priority may be automating the back office to become the low-cost provider. For others, it may be leveraging analytics to become a market leader in an ETF category or using digital platforms to offer a superior client experience. In all cases, strong leadership and change management are critical.

The strategic imperative for digital transformation across the investment management ecosystem is ultimately about future-proofing these organisations. The global financial landscape will undoubtedly feature even more tech-centric competition. Clients will continue to raise the bar for what they expect, influenced by their experiences in other digitally advanced sectors.

Regulators increasingly expect financial institutions to have robust digital infrastructure, both for resilience and market transparency. The Digital Operational Resilience Act (DORA), introduced by the European Union (EU) in January 2025, aims to strengthen the digital resilience of financial entities, ensuring that banks, insurance companies and other financial institutions can respond to disruptions in information and communication technology, such as cyberattacks or system failures.

Digital transformation should be viewed as a continuous strategic priority: it is a journey of constant adaptation and improvement. Companies that do not transform risk irrelevance, as they may survive for a time on legacy strengths but gradually lose competitive edge as tech-enabled companies capture the next generation of investors, operating with superior economics.

In conclusion, digital transformation in the financial sector is about fundamentally redefining how investment managers create value, manage risk and serve their clients in a digital world. It is an urgent, strategic necessity for any company that intends to remain in the vanguard of investment and wealth management.

References

(1) Bérubé, V., Gagné, G., Jacques, F. and Tarnowski, M. (July 2022), 'It's time to become a digital investing organization', McKinsey & Co., available at https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/its-time-to-become-a-digital-investing-organization (accessed 26th August, 2025).

(2) Bector, R., Godsall, J., Koch, P., Kumar, A., Petzold, B., Pingaro, T. and Sharma,

P. (June 2023), 'How asset managers can create strategic distance with technology', McKinsey & Co., available at https://www.mckinsey.com/industries/financial-services/our-insights/banking-matters/how-asset-managers-can-create-strategic-distance-with-technology (accessed 26th August, 2025).
(3) *Ibid*.
(4) Nazara, D. S., Sutrisno, A., Nersiwad and Muslimin, M. (October 2024), 'Digital Transformation in Operations Management: Leveraging Technology to Improve Business Efficiency', *Maneggio Journal*, Vol. 1, No. 5, pp. 77–84.
(5) Abidi, N., El Herradi, M. and Sakha, S. (May 2023), 'Digitalization and resilience during the COVID-19 pandemic', *Telecommunications Policy*, Vol. 47, No. 4, 102522.
(6) Aro, O. E. (October 2024), 'Data analytics as a driver of digital transformation in financial institutions', *World Journal of Advanced Research and Reviews*, Vol. 24, No. 1, pp. 1054–1072.
(7) Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N. and Haenlein, M. (2021), 'Digital transformation: A multidisciplinary reflection and research agenda', *Journal of Business Research*, Vol. 122, pp. 889–901.
(8) Brynjolfsson, E. and McElheran, K. (2016), 'The Rapid Adoption of Data-Driven Decision-Making', *American Economic Review*, Vol. 106, No. 5, pp. 133–139.
(9) Smith, T., Lush, M., Desmana, G., Dost, G. and Kearns-Manolatos, D. (November 2023), 'Mapping Digital Transformation Value – Metrics that Matter', Deloitte Research, available at https://www.deloitte.com/content/dam/assets-shared/docs/collections/2024/mapping-digital-transformation-value-metrics-that-matter.pdf (accessed 26th August, 2025).
(10) Charles, A. (November 2024), 'Unleashing the transformative power of disruptive technology', PricewaterhouseCooper (PwC), available at https://pwcplus.de/en/article/246086/asset-and-wealth-management-revolution-2024-unleashing-the-transformative-power-of-disruptive-technology/ (accessed 26th August, 2025).
(11) Tabrizi, B., Lam, E., Girard, K. and Irvin, V. (March 2019), 'Digital Transformation Is Not About Technology', Harvard Business Review, available at https://hbr.org/2019/03/digital-transformation-is-not-about-technology (accessed 26th August, 2025).
(12) O'Brien, S. (September 2023), 'ESG Digital Transformation: Combining Sustainability and Digitization in Tech Upgrades', IEEE Computer Society, available at https://www.computer.org/publications/tech-news/trends/sustainability-digitization-in-tech (accessed 26th August, 2025).
(13) Verhagen, A., Luget, A., Stergiou, V., Banerjee, D. and Conjeaud, O. (August 2025), 'How agentic AI can change the way banks fight financial crime', McKinsey & Co., available at https://www.mckinsey.com/capabilities/risk-and-resilience/our-insights/how-agentic-ai-can-change-the-way-banks-fight-financial-crime (accessed 26th August, 2025).
(14) Zhen, X. and Yiyang Zhou, Y. (2025), 'Digital transformation and corporate creditworthiness, *Finance Research Letters*, Vol. 74, 106742.
(15) Zhang, C. (2025), 'How does enterprise digital transformation affect the cost of debt financing? Based on the perspective of customer concentration risk', *International Review of Economics & Finance*, Vol. 103, 104426.